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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,910	08/31/2001	James R. Curtis	10014656-1	8139

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HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, CO 80527-2400

EXAMINER
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PWU, JEFFREY C

ART UNIT	PAPER NUMBER
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2143

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/942,910

Applicant(s)

CURTIS, JAMES R.

Examiner

Jeffrey Pwu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being unpatentable over Chao et al. (U.S. 6,438,705).

Chao et al. disclose claims :

1. A process for determining whether a Resource on a Cluster may be locked by a First Node, wherein the Cluster includes the First Node and at least one Peer Node, comprising:

communicating a request by a First Node to establish a lock on a Resource accessible through the Cluster (node A);

determining whether the at least one Peer Node on the Cluster holds an active lock on the Resource (col.4, lines 9-19);

if an active lock on the Resource is not held by any of the at least one Peer Node, approving the lock request (col.4, lines 9-64); and

if an active lock on the Resource is held by any of the at least one Peer Node, further comprising: determining for each active lock held on the Resource whether the requested lock conflicts with the active lock (see “quorum resource”);

if the requested lock does not conflict with the active lock, approving the lock request; and if the requested lock conflicts with the active lock, denying the lock request (col.3, lines 28-col.4, line 18).

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2. The process of claim 1, wherein the lock request further comprises: a lock name; an intent mode; and a deny mode, wherein the lock name provides an identification of the Resource. (“The device used as a quorum resource can be anything with three properties: it can store data durably (across failure); the other cluster node can get at it; and it can be forcibly acquired by one node to the exclusion of all others.”).

3. The process of claim 2, wherein the active lock further comprises: a lock name; an intent mode; and a deny mode, wherein the lock name provides an identification of the Resource (it is inherent in quorum algorithm the active lock comprises a lock name; an intent mode; and a deny mode, wherein the lock name provides an identification of the Resource).

4. The process of claim 3, wherein the determination of whether an active lock on the Resource is held by any of the at least one Peer Node further comprises: comparing the lock name of the requested lock with the lock name of each active lock held by each of the at least one Peer Node; determining that an active lock is held on the Resource if the lock name of the requested lock and the lock name of any active lock held by any of the at least one Peer Node identifies the same Resource; and determining that an active lock is not held on the Resource if the lock name of the requested lock and the lock name of every active lock held by any of the at least one Peer Node does not identify the same Resource (col.8, lines 6-41).

5. The process of claim 4, wherein the comparisons of the lock names are accomplished at each of the at least one Peer Node and further comprise examining each entry in a Lock Broker Table (see event table & SQL table; figs.5 & 6).

6. The process of claim 5, wherein each of the at least one Peer Node maintains a separate Lock Broker Table (figs.5 & 6).

7. The process of claim 3, wherein the determination of whether the requested lock conflicts with the active lock further comprises: comparing the intent mode of the lock request with the deny mode of the active lock; and comparing the deny mode of the active lock with the intent mode of

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the lock request; whereupon failure of either of the comparing steps, the lock request is denied and whereupon passing of both of the comparing steps, the lock request is approved (see flow chart of figs.4).

8. The process of claim 7, whereupon obtaining approval of the requested lock from each of the at least one Peer Node, the First Node establishes an active lock on the Resource (see 310)

9. The process of claim 7, whereupon obtaining a denial of the lock request, the process further comprises; placing the lock request in a pending state at the Peer Node; awaiting notification that the active lock which conflicted with the lock request has been released; and repeating the process identified in claim 1 (col.9, line 10-38).

10. The process of claim 1, wherein the Resource further comprises: at least one virtual or real device, accessible through the Cluster, selected from the group consisting of: a data file, a database, a printer, a server, a display monitor, a personal computer, and an element of a personal computer (col.1, line 23-col.3, line 8).

11. The process of claim 1, wherein the lock request further comprises a read/write request (see CSQL).

12. A process for implementing a Cluster wide lock broker comprising: installing a lock broker daemon on each Node of a Cluster, wherein the Cluster includes at least two Nodes; establishing a Lock Broker Table associated with each lock broker daemon; and determining whether a lock request will be granted by comparing the lock request with each entry in each Lock Broker Table; whereupon receiving at a First Node a request from a Client to establish a lock on a Resource connected to the Cluster, the lock broker daemon communicates the lock request to each Peer Node on the Cluster; and whereupon receiving the lock request, each Peer Node determines whether the requested lock conflicts with any active lock already held by a Client associated with the Peer Node by examining the contents of the Lock Broker Table associated with the lock broker daemon for the Peer Node ("The process for the multi-cluster software

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illustrated herein can scale to larger sizes easily. For example, FIG. 3a shows an eight-node configuration, wherein each node 350 is coupled to a storage element 340 by disk controllers 360. Cluster services 304 in FIG. 3 allows fail-over to be between any two nodes in this eight-node cluster”);

13. The process of claim 12, wherein the process is implemented in conjunction -with the Cluster management system (302).

14. The process of claim 12, wherein the process further comprises inserting the lock request as an active lock into the First Node's Lock Broker Table when the lock request is approved by every Peer Node on the Cluster (claims 14 is similarly rejected as in claims 1-11).

15. The process of claim 14, wherein the process further comprises removing the active lock from the First Node's Lock Broker Table when the Client is finished utilizing the Resource (claims 15 is similarly rejected as in claims 1-11).

16. The process of claim 14, wherein the process further comprises deleting the active lock from the First Node's Lock Broker Table when a connection between the First Node and the Resource is disconnected (claims 14 is similarly rejected as in claims 1-11).

17. A computer readable medium containing instructions for determining whether a Client may establish a lock on a Resource accessible through a Cluster, wherein the Client is on a First Node of the Cluster and the Resource is on a Peer Node of the Cluster, by: communicating a request by the Client via the First Node to establish a lock on the Resource; determining whether at least one Peer Node holds an active lock on the Resource; if an active lock on the Resource is not held by any of the at least one Peer Node, approving the lock request; and if an active lock on the Resource is held by any of the at least one Peer Node, further comprising: determining for each active lock held on the Resource whether the requested lock conflicts with the active lock; if the requested lock does not conflict with the active lock, approving the lock request; and if the

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requested lock conflicts with the active lock, denying the lock request (claims 17 is similarly rejected as in claims 1-11).

18. A computer readable medium containing instructions for determining whether a requested lock conflicts with an active lock, wherein each of the requested lock and the active lock include a lock name, identifying a Resource on a Cluster, an intent mode, and a deny mode, by: comparing a lock name for the requested lock against the lock name of the active lock; determining that an active lock is held on a Resource if the lock name of the requested lock and the lock name of the active lock identify the same Resource; determining that an active lock is not held on the Resource if the lock name of the requested lock and the lock name of the active lock do not identify the same Resource; and repeating the process for each active lock held by each Peer Node on the Cluster (claims 18 is similarly rejected as in claims 1-11).

19. The computer readable medium of claim 18, wherein each active lock held by a Peer Node is identified in a Lock Broker Table managed by a lock broker daemon on the Peer Node and wherein the lock request is communicated to every Peer Node on the Cluster for the determination of whether an active lock is held on the Resource (claims 19 is similarly rejected as in claims 1-11).

20. The computer readable medium of claim 19, wherein the instructions further include determining whether a conflict exists between the requested lock and an active lock when a determination has been made that an active lock is held on the Resource, by: comparing an intent mode of the lock request with a deny mode of the active lock; and comparing a deny mode of the active lock with an intent mode of the lock request; whereupon failure of either of the comparing steps, the Peer Node associated with the active lock denies the lock request and whereupon passing of both of the comparing steps, the Peer Node associated with the active lock approves the lock request (claims 20 is similarly rejected as in claims 1-11).

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3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Pwu whose telephone number is 571 272-6798. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on 571 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



January 23, 2005

JEFFREY PWU  
PRIMARY EXAMINER